PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : A01N 35/10, 25/32 // (A01N 35/10, 35:10, 43:653) — A1

(11) International Publication Number: **WO 99/08520**

(43) International Publication Date: 25 February 1999 (25.02.99)

(21) International Application Number: PCT/GB98/02261

(22) International Filing Date: 28 July 1998 (28.07.98)

(30) Priority Data:
9717321.5 15 August 1997 (15.08.97) GB

(71) Applicant *(for all designated States except US)*: ZENECA LIMITED [GB/GB]; 15 Stanhope Gate, London W1Y 6LN (GB).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: SAUNDERS, Clare, Hilary [GB/GB]; Zeneca Agrochemicals, Fernhurst, Haslemere, Surrey GU27 3JE (GB). SUTTON, Peter, Bernard [GB/GB]; Jealott's Hill Research Station, Bracknell, Berkshire RG42 6ET (GB). MURFITT, Roger, Cyrill [GB/GB]; Jealott's Hill Research Station, Bracknell, Berkshire RG42 6ET (GB).

(74) Agents: WATERMAN, John, Richard et al.; Zeneca Agrochemicals, Intellectual Property Dept., Jealott's Hill Research Station, P.O. Box 3538, Bracknell, Berkshire RG42 6YA (GB).

(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published
With international search report.

(54) Title: HERBICIDAL COMPOSITIONS

(57) Abstract

A herbicidal composition comprising as active ingredients tralkoxydim and butroxydim.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	**ES**	Spain	**LS**	Lesotho	**SI**	Slovenia
AM	Armenia	**FI**	Finland	**LT**	Lithuania	**SK**	Slovakia
AT	Austria	**FR**	France	**LU**	Luxembourg	**SN**	Senegal
AU	Australia	**GA**	Gabon	**LV**	Latvia	**SZ**	Swaziland
AZ	Azerbaijan	**GB**	United Kingdom	**MC**	Monaco	**TD**	Chad
BA	Bosnia and Herzegovina	**GE**	Georgia	**MD**	Republic of Moldova	**TG**	Togo
BB	Barbados	**GH**	Ghana	**MG**	Madagascar	**TJ**	Tajikistan
BE	Belgium	**GN**	Guinea	**MK**	The former Yugoslav Republic of Macedonia	**TM**	Turkmenistan
BF	Burkina Faso	**GR**	Greece			**TR**	Turkey
BG	Bulgaria	**HU**	Hungary	**ML**	Mali	**TT**	Trinidad and Tobago
BJ	Benin	**IE**	Ireland	**MN**	Mongolia	**UA**	Ukraine
BR	Brazil	**IL**	Israel	**MR**	Mauritania	**UG**	Uganda
BY	Belarus	**IS**	Iceland	**MW**	Malawi	**US**	United States of America
CA	Canada	**IT**	Italy	**MX**	Mexico	**UZ**	Uzbekistan
CF	Central African Republic	**JP**	Japan	**NE**	Niger	**VN**	Viet Nam
CG	Congo	**KE**	Kenya	**NL**	Netherlands	**YU**	Yugoslavia
CH	Switzerland	**KG**	Kyrgyzstan	**NO**	Norway	**ZW**	Zimbabwe
CI	Côte d'Ivoire	**KP**	Democratic People's Republic of Korea	**NZ**	New Zealand		
CM	Cameroon			**PL**	Poland		
CN	China	**KR**	Republic of Korea	**PT**	Portugal		
CU	Cuba	**KZ**	Kazakstan	**RO**	Romania		
CZ	Czech Republic	**LC**	Saint Lucia	**RU**	Russian Federation		
DE	Germany	**LI**	Liechtenstein	**SD**	Sudan		
DK	Denmark	**LK**	Sri Lanka	**SE**	Sweden		
EE	Estonia	**LR**	Liberia	**SG**	Singapore		

HERBICIDAL COMPOSITIONS

The present invention relates to herbicidal compositions comprising two or more active ingredients and to methods of controlling unwanted plants using such compositions. More particularly, the invention relates to herbicidal compositions containing tralkoxydim and butroxydim and herbicidal methods using such compositions.

The control of unwanted plants is extremely important in achieving high crop efficiency. The selective control of the growth of weeds, particularly in crops such as cereals, is desirable as unchecked weed growth in crops can cause a significant reduction in productivity. The control of unwanted plants in non-crop areas is also important. Hence the need for products that achieve such results continues to be commercially important.

Tralkoxydim, 2-[1-(ethoxyimino)propyl]-3-hydroxy-5-(2,4,6-trimethylphenyl)-2-cyclohexen-1-one, is a selective systemic herbicide which is absorbed by the leaves, it acts by inhibiting cell division. Tralkoxydim is used for the control of *Avena* spp. and other grass species in wheat and barley.

Butroxydim, 2-[1-(ethoxyimino)propyl]-3-hydroxy-5-(3-butyryl-2,4,6-trimethylphenyl)-2-cyclohexen-1-one, is a selective systemic herbicide which is absorbed by the leaves, it acts by inhibiting cell division. Butroxydim is used for the control of *Digitaria* spp. and other grass species in soya and other broad leaved crops.

It has now been found that tralkoxydim can be combined with butroxydim to produce extremely active herbicidal compositions.

Therefore, according to the present invention there is provided a herbicidal composition comprising as active ingredients tralkoxydim and butroxydim.

The compositions of the invention have a surprisingly high herbicidal activity which is greater than the sum of the activities of the individual herbicidal components. Thus the combination of tralkoxydim and butroxydim appears to display synergy.

The compositions are capable of controlling the growth of a variety of plants including grass species in a variety of situations such as agriculture and horticulture, forestry and amenity.

In a second aspect of the invention, there is provided a process for limiting the growth of, severely damaging or killing plants, which comprises applying to the plants, or to

the growth medium of the plants, separately, simultaneously or sequentially, a herbicidally effective amount of tralkoxydim and butroxydim.

In the compositions and method of the invention, the ratio of tralkoxydim to butroxydim may vary considerably but will suitably be within the range 1 to 60 : 1, particularly 6 to 20 : 1 by weight.

The rate of application of active ingredients in the compositions and method of the invention will depend on a number of factors including, the plants to be controlled, the crop plants, the prevailing climatic conditions, the soil type, whether the active ingredients are applied for foliage or root uptake and whether the active ingredients are applied simultaneously, separately or sequentially.

As a general guide an application rate of from 75 to 450 g/ha of tralkoxydim is suitable while from 100 to 200 g/ha may be preferred. The amount of butroxydim can be calculated from the ratios of tralkoxydim to butroxydim given above.

In the method of the invention the active ingredients may be formulated separately then applied simultaneously, separately or sequentially in an appropriate ratio, e.g. as a tank mix. However it is preferred that the active ingredients are formulated together as a single composition according to the invention.

The composition may be formed of the active ingredients alone but will more usually contain a carrier comprising a solid or liquid diluent.

Solid compositions may be in the form of granules, or dusting powders in which the active ingredients are mixed with a finely divided solid, e.g. kaolin, bentonite, kieselguhr, dolomite, calcium carbonate, talc, powdered magnesia, Fuller's earth or gypsum. They may also be in the form of dispersible powders or grains, comprising a wetting agent to facilitate the dispersion of the powder or grains in liquid. Solid compositions in the form of a powder may be applied as foliar dusts.

Liquid compositions may comprise a solution or dispersion of the active ingredients in water optionally containing a surface-active agent, or may comprise a solution or dispersion of the active ingredients in a water-immiscible organic solvent which is dispersed as droplets in water.

Surface-active agents may be of the cationic, anionic or non-ionic type, or mixtures thereof. Suitable cationic agents include quaternary ammonium compounds, e.g.

cetyltrimethylammonium bromide. Suitable anionic agents include soaps; salts of aliphatic mono ester of sulfuric acid, e.g. sodium lauryl sulfate; and salts of sulfonated aromatic compounds, e.g. sodium dodecylbenzenesulfonate, sodium, calcium, and ammonium lignosulfonate, butylnaphthalene sulfonate, and mixtures of the sodium salts of diisopropyl and triisopropylnaphthalenesulfonic acid. Suitable non-ionic agents include the condensation products of ethylene oxide with fatty alcohols such as oleyl alcohol and cetyl alcohol, or with alkylphenols such as octyl- or nonyl-phenol (e.g. Agral 90) or octyl-cresol. Other non-ionic agents are the partial esters derived from long chain fatty acids and hexitol anhydrides, e.g. sorbitan monolaurate; the condensation products of the partial ester with ethylene oxide; the lecithins; and silicone surface active agents (water soluble surface-active agents having a skeleton which comprises a siloxane chain e.g. Silwet L77). A suitable mixture in mineral oil is Atplus 411F. Preferred surface-active agents include TF8035 and the like. The surface-active agent is preferably present in the composition at a concentration of from about 0.2 to about 1.0 % by weight.

Aqueous solutions or dispersions may be prepared by dissolving the active ingredients in water or an organic solvent optionally containing wetting or dispersing agent(s) and then, when organic solvents are used, adding the mixture so obtained to water optionally containing wetting or dispersing agent(s). Suitable organic solvents include ethylene dichloride, isopropyl alcohol, propylene glycol, diacetone alcohol, toluene, kerosene, methylnaphthalene, xylenes and trichloroethylene.

Compositions may be either dilute preparations, which are ready for immediate use, or concentrated compositions, which are usually diluted before use e.g. with water. The compositions preferably contain from 0.01% to 90% by weight of the active ingredients.

Dilute compositions may contain varying amounts of the active ingredients depending upon the intended purpose, amounts of 0.01% to 10.0% and preferably 0.1% to 2%, by weight of active ingredients are normally used.

Concentrated compositions may contain from 20 to 90% by weight of active ingredients, although from 20 to 70% is usually preferred.

Compositions for use in the form of aqueous solutions or dispersions are generally supplied in the form of a concentrate containing a high proportion of the active ingredients, and the concentrate is then diluted with water before use. Concentrates are usually required

to withstand storage for prolonged periods and after such storage to be capable of dilution to give compositions which remain homogeneous for sufficient time to enable them to be applied using conventional spray equipment.

A preferred form of concentrated composition comprises finely divided active ingredients which have been dispersed in water in the presence of a surface-active agent and a suspending agent. Suitable suspending agents are hydrophilic colloids and include, for example, polyvinylpyrrolidone and sodium carboxymethylcellulose, and the vegetable gums, for example gum acacia and gum tragacanth. Preferred suspending agents are those which impart thixotropic properties to, and increase the viscosity of, the concentrate. Examples of preferred suspending agents include hydrated colloidal mineral silicates, such as montmorillonite, beidellite, nontronite, hectorite, saponite and saucorite. Bentonite is especially preferred. Other suspending agents include cellulose derivatives and polyvinyl alcohol.

Compositions may comprise, in addition to tralkoxydim and butroxydim, one or more compounds not of the invention but which possess biological activity. According to a further aspect of the invention, there is provided a herbicidal composition comprising a mixture of at least tralkoxydim and butroxydim, with at least one other herbicide.

The other herbicide will generally be a herbicide having a complementary action to tralkoxydim and butroxydim.

Examples of useful complementary herbicides include:

A. benzo-2,1,3-thiadiazin-4-one-2,2-dioxides such as bentazone;

B. hormone herbicides and derivatives thereof e.g. salts, esters and amides, such as 2,4,5-T, 2,4-D, 2,4-DB, clopyralid, dichlorprop, dichlorprop-p, fluroxypyr, MCPA, MCPA-thioethyl, MCPB, mecoprop, mecoprop-p, picloram, thiazopyr, and trichlopyr;

C. 1,3-dimethylpyrazole derivatives such as benzofenap, pyrazolate and pyrazoxyfen;

D. dinitrophenols and their derivatives, e.g. acetates, such as dinoterb and DNOC;

E. dinitroanilines such as dinitramine, ethalfluralin, fluchloralin, oryzalin, pendimethalin, prodiamine and trifluralin;

F. arylureas such as chlorobromuron, chlorotoluron, daimuron, dimefuron, diuron, fenuron, flumeturon, isoproturon, isourn, linuron, methabenzthiazuron, methyldymron, metobromuron, metoxuron, monolinuron, neburon and tebuthiuron;

G. phenylcarbamoyloxyphenylcarbamates such as desmedipham and phenmedipham;

H. phenylpyrazoles such as ET-751;

I. 2-phenylpyridazin-3-ones such as chloridazon and norflurazon;

J. pyridones such as fluridone;

K. pyrimidinyloxybenzoic herbicides such as DPX-PE350 (pyrithiobac-sodium) and KIH-2023 (bispyribac-sodium);

L. uracil herbicides such as bromacil, lenacil and terbacil;

M. triazines such as amytryn, atrazine, cyanazine, dimethametryn, prometon, prometryn, propazine, simazine, simetryne terbuthylazine, terbutryn and trietazine;

N. triazoles such as amitrole;

O. triazolinones such as carfentrazone (F-8426) and sulfentrazone (F-6285);

P. phosphorothioates such as bensulide, butamifos and piperophos;

Q. phthalamides such as flumioxazin;

R. thiocarbamates such as butylate*, cycloate, dimepiperate, EPTC*, esprocarb, molinate, orbencarb, pebulate, prosulfocarb, thiobencarb, tiocarbazil, tri-allate and vernolate;

S. 1,2,4-triazin-5-ones such as metamitron and metribuzin;

T. benzoic acid herbicides such as 2,3,6-TBA, chloramben and dicamba;

U. chloroacetanilides such as acetochlor, alachlor, butachlor, dimethachlor, dimethanamid, metazachlor, metolachlor, pretilachlor, propachlor, and thenylchlor (NSK-850);

V. dihalobenzonitriles such as bromoxynil, dichlobenil, ioxynil and the dihalobenzonitrile herbicide precursor bromofenoxim;

W. haloalkanoic herbicides such as TCA and salts thereof and dalapon;

X. diphenylethers such as aciflurofen and salts and esters thereof, aclonifen, bifenox, chlomethoxyfen, chlornitrofen, fluroglycofen and salts and esters thereof, fomesafen and lactofen;

Y. diphenylureas such as oxyfluorfen;

Z. phenoxyphenoxypropionates such as clodinafop-propargyl, cyhalofop-butyl (DEH-112), diclofop and esters thereof e.g. the methyl ester, fenoxaprop and esters thereof e.g. the ethyl ester, fluazifop and esters thereof, haloxyfop and esters thereof, propaquizafop, quizalofop and esters thereof and quizalofop-p-tefuryl;

AA. cyclohexanediones such as alloxydim and salts thereof, clethodim, cycloxydim and sethoxydim;

BB. sulfonyl ureas such as amidosulfuron, azimsulfuron, benzsulfuron and esters thereof such as DPX-M6313, chlorimuron and esters thereof such as the ethyl ester, chlorosulfuron, cinosulfuron, ethametsulfuron-methyl, flazasulfuron, halosulfuron, HOE-95404, imazosulfuron, metsulfuron and esters thereof, nicosulfuron, pirimisulfuron and esters thereof such as the methyl ester, prosulfuron, pyrazosulfuron, rimsulfuron, sulfometuron, thifensulfuron, triasulfuron, tribenuron, tribenuron-methyl and triflusulfuron-methyl;

CC. imidazolinones such as imazamethabenz, imazapyr and isopropylammonium salts thereof, imazaquin and imazethapyr;

DD. methyl isothiocyanate herbicide precursors such as dazomet;

EE. arylanilides such as diflufenican, flamprop, flamprop-M and esters thereof;

FF. quinolinecarboxylic acids such as quimerac and quinclorac;

GG. amino acid herbicides such as bialaphos, glyphosate and glufosinate and their salts and esters and sulfosate;

HH. organoarsenical herbicides such as DSMA and monosodium methanearsonate (MSMA);

II. organophosphorus herbicides such as anilofos and fosamine-ammonium;

JJ. herbicidal amide derivatives such as carbetamide, FOE-5043, isoxaben, napropamide, naptalam, propyzamide and tebutam;

KK. sulfamoylureas such as AC-322,140 (cyclosulfamuron);

LL. sulfonanilides such as chloransulam-methyl, DE-511 (metosulam) and flumetsulan;

MM. carbamates such as chlorpropham;

NN. triketones such as sulcotrione;

OO. miscellaneous herbicides such as ammonium sulfamate, asulam, benazolin, cinmethylin, clomazone, difenzoquat and salts thereof e.g. the methyl sulfate salt, dimethipin, diphenamid, dithiopyr, ethofumesate, fumiclorac, flupoxam, flurenol-butyl, flurochloridone, flurtamone, hexazinone, HW-32, KIH-9201 (fluthiacet-methyl), KPP-314, mefenacet, oxadiazon, pyridate, RPA-201772 (isoxaflutole), sodium chlorate and thidiazimin; and

PP. contact herbicides including bipyridylium herbicides such as diquat and paraquat;

In addition to the active ingredients the compositions of the invention may contain a safener such as AD-67, benoxacor, cloquintocet-mexyl, dichlormid, fenchlorazole-ethyl, mefenpyr-diethyl, fenclorim, fluxofenim, furilazole, MG-191, naphthalic anhydride, oxabentrinil or R-29148. Particularly preferred safeners are fenchlorazole-ethyl, mefenpyr-diethyl and cloquintocet-mexyl, especially fenchlorazole-ethyl. The ratio of active ingredients to safener present in the compositions of the invention is preferably in the range 1 to 6 : 1, more preferably 2 to 4 : 1.

The discussion above refers to compositions but it should be borne in mind that according to the invention the active ingredients may be provided as a single composition or, alternatively, as separate compositions.

The compositions and method of the invention are capable of controlling a range of both annual and perennial grass weeds although their effects are particularly marked for perennial weeds which are commercially important species

The compositions and method of the invention may be used on a range of crops. Crops are to be understood as including those crops which have been made tolerant to herbicides or classes of herbicide by conventional methods of breeding or gene technology. The compositions and method are especially useful for the control of weeds in cereal crops such as wheat and barley because they show selectivity towards these crops. They are particularly effective in controlling grass species, especially *Avena fatua*, *Alopecurus*

myosuroides, *Lolium rigidum* and *Setaria viridis* which are commercially important weeds in cereal crops.

The compositions and method of the invention are suitable for all methods of application, however they are preferably used for post-emergence application.

The invention is illustrated by the following Example:

Example 1

Comparison of herbicidal activity of tralkoxydim, butroxydim and tralkoxydim / butroxydim mixtures

Compositions were tested as follows.

a) Tralkoxydim applied at rates of 6.25, 12.5 and 25 g/ha.

b) Butroxydim applied at rates of 1, 2 and 4 g/ha.

c) Tralkoxydim applied at rates of 6.25, 12.5 and 25 g/ha in admixture with butroxydim applied at rates of 1, 2 and 4 g/ha, with and without the addition of 6.25 g/ha of the safener fenchlorazole.

The composition of the these materials was as follows:

Tralkoxydim - 80% WG

Butroxydim - 26% WG

Fenchlorazole - technical formulated as an SC for spraying.

All treatments were formulated in tap water and applied with the addition of 0.5% of the surface active agent Turbocharge (available from Zeneca Ltd) to three replicates, two of which were randomised

Plants were sprayed with a tracksprayer with a 8001E nozzle, at a spray height of 30 cm and spray application volume of 200 l/ha. After spraying the plants were laid out in a glasshouse and maintained at a temperature of 16°C by day and 12°C by night with a 14 hour photoperiod. Plants were watered by hand into the top of the pots for the duration of the test, taking care to avoid wetting the foliage for the first 5 days after spraying.

The plant species treated were:

a) Crops

TRZAW Winter wheat cv. Prinqual

HORVW Winter barley cv. Plaisant

b) Weeds

AVEFA *Avena fatua*

ALOMY *Alopecurus myosuroides*

LOLRI *Lolium rigidum*

SETVI *Setaria viridis*

Damage to wheat and barley plants was assessed 9 DAT (days after treatment) while damage to the weed species was assessed 26 DAT by comparison with untreated plants, on a 0-100% scale where 0% is no damage and 100% is complete kill. The results are set out in Table I below. The results for each test are shown together with the Similar Action expected value (E) which is the expected value if there is no synergy between the two compounds.

The expected values were based on an assumption of "similar action", i.e. that the compounds act at the same site in the plant with the same mode of action, and were generated as described by RL Plackett and PS Hewlett (1952), "Quantal responses to mixtures of poisons", JRSS, B, 14, 141-163. Whilst the assumption of similar action is considered to be the most appropriate in this case, derivation of expected values based on an assumption of independent action leads to the same overall conclusions.

TABLE I

Tralkoxydim g/ha	Butroxydim g/ha	Fenchlorazole-ethyl	SPECIES					
			TRZAW	HORVW	AVEFA	ALOMY	LOLRI	SETVI
6.25	-	N	0	0	45	1	79	68
12.5	-	N	0	0	63	36	94	92
25	-	N	0	0	92	84	95	94
-	1	N	5	7	2	1	2	30
-	2	N	17	10	1	1	88	96
6.25	1	N	8	7	73 (E=38)	39 (E=13)	94 (E=95)	96 (E=94)
12.5	1	N	13	12	98 (E=88)	92 (E=67)	100 (E=100)	95 (E=99)
25	1	N	11	11	97 (E=99)	92 (E=98)	100 (E=100)	96 (E=100)
6.25	1	Y	12	8	59 (E=63)	38 (E=20)	87 (E=99)	92 (E=94)
12.5	1	Y	11	8	89 (E=92)	73 (E=75)	97 (E=100)	96 (E=99)
25	1	Y	12	9	100 (E=99)	96 (E=99)	99 (E=100)	94 (E=100)
6.25	2	N	14	8	92 (E=75)	70 (E=52)	100 (E=99)	96 (E=98)
12.5	2	N	18	18	85 (E=94)	88 (E=89)	100 (E=100)	97 (E=100)
25	2	N	18	17	99 (E=100)	96 (E=100)	100 (E=100)	96 (E=100)
6.25	2	Y	16	13	95 (E=88)	95 (E=70)	100 (E=100)	95 (E=99)
12.5	2	Y	18	17	97 (E=97)	89 (E=93)	99 (E=100)	98 (E=100)
25	2	Y	19	18	100 (E=100)	96 (E=100)	100 (E=100)	97 (E=100)

The results show that compositions containing tralkoxydim and butroxydim are considerably more effective in controlling *Avena fatua*, *Alopecurus myosuroides*, *Lolium rigidum* and *Setaria viridis* than either tralkoxydim or butroxydim alone. More surprisingly, for these weeds, the combination is more effective than would have been expected from a calculation of the sum of the effects of the two individual components.

CLAIMS

1. A herbicidal composition comprising as active ingredients tralkoxydim and butroxydim.

2. A herbicidal composition according to claim 1, comprising tralkoxydim and butroxydim in admixture with a carrier comprising a solid or liquid diluent.

3. A composition according to claim 1 or 2, wherein the ratio of tralkoxydim to butroxydim is in the range 1 to 60 : 1 by weight.

4. A composition according to claim 3, wherein the ratio of tralkoxydim to butroxydim is in the range 6 to 20 : 1 by weight.

5. A composition according to any one of the preceding claims, which contains a safener.

6. A composition according to claim 5, wherein the safener is fenchlorazole-ethyl.

7. A composition according to claim 5 or 6, wherein the ratio of active ingredients to safener is in the range 1 to 6 : 1 by weight.

8. A composition according to any one of the preceding claims, for use on a cereal crop.

9. A composition according to any one of the preceding claims, for use in limiting the growth of, severely damaging or killing grass species.

10. A process for limiting the growth of, severely damaging or killing plants, which comprises applying to the plants, or to the growth medium of the plants, separately,

simultaneously or sequentially, a herbicidally effective amount of tralkoxydim and butroxydim.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 98/02261

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A01N35/10 A01N25/32 //(A01N35/10,35:10,43:653)

According to International Patent Classification(IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 A01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 93 04581 A (COLBY S ROBERT ;CASEY JOHN STEPHEN (US); ANDERSON JAMES (JP)) 18 March 1993 see page 1 - page 4; examples I,,,II	1-10
A	EP 0 542 687 A (CIBA GEIGY AG) 19 May 1993 see page 3 - page 4, line 4 see page 4, line 42 - page 5, line 27; claims 1,7; table 5	1-10
A	US 5 629 262 A (AUXIER BARBARA G ET AL) 13 May 1997 see column 1, line 5 - line 33 see column 2, line 23 - line 38	1-10
A	US 4 874 421 A (KLESCHICK WILLIAM A ET AL) 17 October 1989 see column 1, line 5 - column 2, line 31	1-10

[ ] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
19 November 1998	27/11/1998

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Muellners, W

1

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/GB 98/02261

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9304581 A	18-03-1993	AU 658452 B	13-04-1995
		AU 2677692 A	05-04-1993
		BR 9206485 A	24-10-1995
		CA 2118794 A	18-03-1993
		EP 0603336 A	29-06-1994
		MX 9205213 A	01-06-1993
		NZ 244308 A	27-04-1995
		ZA 9206934 A	11-03-1994
EP 0542687 A	19-05-1993	AU 652298 B	18-08-1994
		AU 2836692 A	20-05-1993
		CA 2082845 A	16-05-1993
		CN 1072312 A	26-05-1993
		FI 925122 A	16-05-1993
		LV 10150 A	20-10-1994
		MX 9206535 A	01-05-1993
		NZ 245130 A	27-09-1994
		PL 296584 A	02-11-1993
		SK 322292 A	06-12-1995
		US 5296449 A	22-03-1994
		LT 224 A	25-08-1994
		ZA 9208762 A	10-06-1993
US 5629262 A	13-05-1997	NONE	
US 4874421 A	17-10-1989	NONE	